

MATERIAL SAFETY DATA SHEET**1. IDENTIFICATION OF THE SUBSTANCE AND THE COMPANY**

Identification of the Substance: DK ESTER F-20W

Use of Substance: Emulsifying agent for food, pharmaceuticals, etc.

Company Identification:

DAI-ICHI KOGYO SEIYAKU CO., LTD.

600-8873, 55 Nishi-Shichijo Higashikubo-cho, Shimogyo-ku, Kyoto Japan

Phone: +81-75-321-1477

2. COMPOSITION ON INGREDIENTS

Component: α -D-Glucopyranoside, β -D-fructofuranosyl, octadecanoate

CAS: 37318-31-3

EINECS: 253-459-6

Exposure Limits: Not applicable.

% by. Wt.: 100

3. HAZARDS IDENTIFICATION

Emergency Overview:

Color: White~light yellowish brown

Physical form: Powder

Odor: Almost odorless or slightly peculiar odor.

Major health hazards: Not so hazardous under usual handling conditions.

Physical hazards: Dust explosion possible under specific circumstances.

Potential Health Effects:

Eye: Contact with eyes may cause mild irritation.

Skin: Contact with skin may cause mild irritation.

Inhalation: May not cause respiratory irritation.

Chronic Toxicity Information: May not cause chronic toxicity, based on animal studies.

Cancer Information: Not listed on IARC.

Teratology (Birth defect) information: May not cause birth defects, based on animal studies.

Reproduction information: No data.

Potential Environmental Effects: Material may be hazardous to aquatic organisms, based on animal studies.

4. FIRST AID MEASURES

Eyes: Flush immediately with plenty of low pressured water for 15 minutes at least and seek medical aid.

Skin: Flush immediately with soap and water. If needed, consult a doctor.

Ingestion: Rinse the mouth with water and give a cup of water or milk if conscious.

Seek medical aid immediately.

Inhalation: Get fresh air and rest. If needed, consult a doctor.

Note to Physicians: No information is available.

5. FIRE FIGHTING MEASURES

Flammable Properties:

Flash point: 230°C

Method: Ceta Closed Cup

Flammable Limits (Dust explosion) (The similar data)¹⁾:Lower flammable limit: 50~60 g/m³ (Air)Flammable limit: O₂ Concentration 10.0~10.3 vol%

Autoignition Temperature: Not determined.

Hazardous Combustion Products: Oxides of carbon.

Extinguishing Media: Water spray, powder, foam, and carbon dioxide, dry sand.

Fire Fighting Instructions: Move container from fire area if it can be done without risk.

Wear protection such as gloves, glasses, respiratory protection.

Use extinguishing agents appropriate for surrounding fire.

Extinguish from upwind if it's possible.

6. ACCIDENTAL RELEASE MEASURES

Wear protection such as gloves, glasses, respiratory protection. In case of large spill, keep unprotected person away. Ventilate area. Do not let this chemical enter the environment without wastewater treatment.

Sweep up spilled material, then place in a chemical waste container for disposal. Remove without dust dispersing. Use explosion and static electricity-proof equipment. Remove all ignition sources and prepare extinguishing agents. Surfaces of material can become very slippery when wet. Don't walk on contaminated surface unnecessarily. Use safe equipment that doesn't generate spark.

7. HANDLING AND STORAGE

Handling: Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Local exhaust ventilation system is required if dust generates. Use only in a well-ventilated area.

Avoid suspending dust in air. Avoid physical contact by wearing appropriate protection such as glasses, gloves, respiratory protection. Gargle and wash thoroughly after handling.

Storage: Store in well-ventilated area. Keep container sealed. Store in a dry cool and dark indoor place. Avoid direct sunlight, high humidity.

Packaging materials: Use original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: No occupational exposure limits established.

Engineering Controls: Local exhaust ventilation system may be necessary if dust generates.

Provide an emergency eye wash fountain and quick drench shower in the immediate work area. Use explosion and static electricity-proof equipment.

Respiratory Protection: Dust mask is required when exposure is likely exceeded acceptable limits.

Eye Protection: Use appropriate chemical goggles.

Gloves: Use appropriate impervious gloves.

Clothing: Antistatic long-sleeved clothing, etc.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White~light yellowish brown powder

pH: About 7.8

Boiling Point: Not applicable.

Melting Point: 50~58°C.

Flammability: Flammable at about 230°C.

Explosive Properties (The similar data)¹⁾: Lower flammable limit: 50~60 g/m³ (Air)

Flammable limit: O₂ Concentration 10.0~10.3 vol%

Oxidizing Properties: Not applicable.

Bulk Density: 0.3

Volatility: Not applicable.

Vapor Pressure: Not applicable.

Relative Density: Not determined.

Solubility in Water: Almost insoluble.

Solubility in Solvent: Not determined.

Viscosity: Not determined.

Vapor Density (Air=1): Not applicable.

Evaporation Rate: Not applicable.

10. STABILITY AND REACTIVITY

Stability: Stable at normal temperatures and pressure.

Condition to Avoid: Direct sunlight.

Material to Avoid: Sunlight, moisture.

Hazardous Decomposition Products: Not applicable at normal temperatures and pressure.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Eye: Contact with eyes may cause mild irritation.

Skin: Contact with skin may cause mild irritation

Ingestion: The oral LD 50 for rats is min. 2,000 mg/kg. (The similar data)¹⁾

Inhalation: No data. May not cause respiratory irritation.

Subchronic: Rats exposed to 100, 200, 1,000, 2,000 mg/kg a day for 60 days showed no adverse effects.
(Administration in stomach, the similar data of sucrose stearate)²⁾

Chronic: SD-JCL homogeneous rats at 0.15~1.51g/kg for males and 0.17~1.72g/kg for females conducted over a 18 month period showed no compound effect in regard to intoxication and cancerous findings. (The similar data)¹⁾

Carcinogenicity: Not listed on IARC.

Teratology: Rats at 2% of the diet for 3.5 months and over three generations of rats at 1% of the diet over 22 months showed no significant findings. (The similar data)³⁾

Reproduction: No data.

Mutagenicity: No data.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information: No data.

Mobility: No data.

Persistence and Degradability: Easily biodegradable. (The similar data)⁴⁾

Bioaccumulative Potential: No data.

Other Adverse Effects: No data.

13. DISPOSAL CONSIDERATIONS

Incineration of waste material in permitted facilities in accordance with applicable local, State and Federal regulations is the recommended disposal method.

14. TRANSPORT INFORMATION

UN: Not applicable.

Class: Not applicable.

Proper Shipping Name: DK ESTER F-20W

Packing Group: Not applicable.

Marine Pollutant: Not applicable.

Other Applicable information: No information is available.

Any transportation practice must be in compliance with laws and regulation in your country or region.

15. REGULATORY INFORMATION

TSCA: Listed on TSCA Chemical Inventory.

OSHA: Not listed on hazardous substance list.

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. OTHER INFORMATION

The information herein is given in good faith, but no warranty, expressed or implied, is made.

References Cited

1) Data measured by external institution

2) Data sheet of safety and biodegradability of surfactant, first series, p.86, 1987, published by JAPAN SURFACTANT INDUSTRY ASSOCIATION

3) Data sheet of safety and biodegradability of surfactant, forth series, p.67, 1988, published by JAPAN SURFACTANT INDUSTRY ASSOCIATION

4) Data sheet of safety and biodegradability of surfactant, sixth series, p.213, 1990, published by JAPAN SURFACTANT INDUSTRY ASSOCIATION